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THE CONTINUED AND THE FREQUENT DOSE.[1]

BY EDWARD H. CLARKE, M. D.,

Late Professor of Materia Medica in Harvard University.

THE systematic treatises on materia medica with which American and foreign medical literature abounds usually give, near the close of their description of the various drugs whose virtues they rehearse, the appropriate dose for therapeutical use, and also the toxicological dose, if the article is capable of exerting any poisonous action on the human economy. Thus Waring, after describing the salts of morphia, adds, "Dose of the morphia salts, gr. $\frac{1}{8}$–$\frac{1}{4}$–$\frac{1}{2}$ up to gr. 1."[2] Stillé concludes his account of the carbonate of lithium with the statement that it "may be administered in doses of from one to five grains three times a day, dissolved in not less than four ounces of water."[3] The United States Dispensatory, speaking of the sulphate of quinia, says, "The dose varies exceedingly, according to the circumstances of the patient and the object to be accomplished;"[4] and then adds that as a simple tonic, a grain may be given three times a day, or more frequently; that in intermittents, from twelve to twenty-four grains may be given between the paroxysms, in divided quantities, according to the condition of the patient and other circumstances. These and similar statements with regard to the doses of medicines, that may be found in all works on materia medica and therapeutics, are essential. They are true as far as they go, but they do not represent the whole truth. They fail to give to the student and practitioner an accurate notion of what an important factor in therapeutics the dose is; and especially do they fail to convey an accurate notion of the therapeutical importance of variation of dose and method of administration.

In saying this, I do not forget that we are told by all works on materia medica that doses should vary with age, sex, temperament,

[1] Read before the Section of Practical Medicine of the American Medical Association, at Louisville, Kentucky, May 4, 1875.

[2] Practical Therapeutics. American Edition, page 419.

[3] Therapeutics and Materia Medica. Fourth Edition, vol. ii. page 351.

[4] United States Dispensatory. Thirteenth Edition, page 1383.

idiosyncrasy, disease, habit, and the like. This is all true. It has been confirmed by the experience and observation of centuries, but it is not the whole truth. It does not give an adequate notion of the therapeutical power which can be exerted by appropriate physiological doses.

It is the object of this paper to call attention, as briefly as possible, to this therapeutical power, and especially to the action of what, for want of a better designation, may be called the therapeutical action of continued and frequent doses.

Doses of medicines may be appropriately considered under four distinct heads or classes, namely: (1) single doses; (2) continued doses; (3) frequent doses; (4) toxicological doses. The first and last of these, or the single and the toxic dose, are the doses given in treatises on materia medica, and are recognized as representing the therapeutic and poisonous action of any given drug. It is unnecessary to dwell upon them, for they are universally understood. But the bare statement of what is the legitimate single or average toxicological dose of an article like opium, for instance, gives no adequate or intelligent notion of what the continued or frequent dose of the same drug is; nor does it give any adequate or intelligent notion of the physiological action and consequent therapeutical power of its continued or its frequent dose.

Let us consider first the *continued dose.* By this is meant the administration of a drug in such a way that the elimination of one dose shall not be completed before the absorption of the following dose has commenced. "By this method of administration the blood is kept constantly charged with the drug. . . . . The difference between the single and the continued dose is the difference between keeping the blood constantly charged with the article administered, and allowing the blood not only to free itself from one dose, before a second dose is administered, but making the intervals between the doses so long that the blood shall be practically a longer period uncharged than charged with it."

"The observance of this difference is important physiologically and therapeutically. The neglect of it explains much of the confusion and discrepancy that may be found in the statements of different observers with regard to the action of drugs. Many of the phenomena, both physiological and toxicological, that follow the exhibition of the continued, do not follow that of the single dose. And, what is in fact a corollary from this, many therapeutical results may be obtained by the continued that cannot be got from the single dose. It is also to be remarked that, although few or no practitioners write as if they were aware of the important difference here referred to, yet the larger number of observations evidently are founded on the action of the continued dose. Physiologists, on the contrary, seem to have experi-

mented oftenest with the single dose."[1] The continued dose means keeping the blood continuously charged with a medicine by a succession of single doses. The single dose is an appropriate quantity given once or oftener, without keeping it continuously in the blood. The therapeutical value of these doses and the physiological difference between them are of great importance.

Let us look at some illustrations of this difference and value.[2]

Ammonia and its salts "readily enter the blood, and must to some extent increase its alkaline reaction; but from their volatility and high diffusion power they are rapidly eliminated, and hence their action on the blood and the organs of the body is a very transient one."[3] The elimination of a single dose of carbonate of ammonia is practically completed in an hour or two after it is administered. Its physiological action is correctly stated by the United States Dispensatory to be "stimulant, diaphoretic, anti-spasmodic, powerfully antacid, and in large doses emetic." In consequence of this action, it is largely used in depressed conditions of the vital powers. This is the well-known action of a single dose or of a few doses given near together, after which the system is freed by elimination from the drug. No change is produced in the quality of the blood. If a continued dose of ammonia is given, that is, if it is given so often, say every hour for several days, that the blood is continuously charged with it, a very different set of phenomena from those just described appear. "When ammonia or its carbonate is administered" — in this way — "for some time to animals or man, the effect is to modify the blood corpuscles; they become easily soluble, crenate at the edge, many-sided, colorless, transparent, collapsed, and loosely agglomerated, but not in rolls; and the blood when drawn, or after death, is absolutely fluid or loosely coagulated."[4] These phenomena were observed by Dr. B. W. Richardson, of London. They closely resemble the changes in the blood which occur in patients suffering from typhoid and typhus fevers. Hence it appears that the single dose of ammonia produces rapid and effectual stimulation of the heart,

[1] The Physiological and Therapeutical Action of the Bromide of Potassium and Bromide of Ammonia. By Edward H. Clarke, M. D., and Robert Amory, M. D. Pages 34, 35. These remarks, originally applied to the bromide of potassium, are susceptible of general application.

[2] In the discussion which followed the reading of this paper, at the meeting of the medical association, several speakers evidently regarded the paper as advocating *persistent* dosing, or *persistence in dosing*, and criticised it accordingly. It scarcely seems necessary to say that the continued dose which is here described has nothing in common with persistent dosing. In order to administer a continued dose of any drug, the practitioner must know and keep in mind the relation of that drug's elimination to its absorption, and be guided by that relation. A persistent doser may persist in giving medicines indefinitely, and never use the continued dose at all. The art of prescribing will never yield its best results till the physiological action of drugs is understood and recognized.

[3] A Handbook of Therapeutics. By Sydney Ringer, M. D. English Edition, page 111.

[4] Practical Therapeutics. By Edward John Waring. American Edition, page 61.

while the continued dose of the same article alters the quality of the blood, and notably of the blood corpuscles. The single dose exerts a therapeutic, the continued dose a toxic action on the economy. It is unnecessary in this presence to dwell upon the obvious therapeutic inferences that follow from these data, at least so far as ammonia is concerned.

Gallic acid is another illustration of the difference between the single and the continued dose. This acid is rapidly eliminated. Physiologists tell us that in a couple of hours after it has been swallowed, it has practically left the system, by way of the kidneys, to such an extent that it exerts no appreciable action upon the blood after that length of time. Gallic acid has a well-deserved reputation for controlling certains forms of hæmorrhage. Suppose it is given in single doses of ten grains, more or less, three times a day, which I apprehend is the usual method of administration, the blood will be subjected to the restraining action of the acid only about six hours out of the twenty-four ; not long enough to hold steadily in check a hæmorrhagic disposition. Suppose, now, that instead of the single, the continued dose is administered, by which the ratio of elimination to absorption is constantly regarded, and the blood kept continuously charged with gallic acid ; the result will be a continuous action upon the blood, not an intermittent one. It is needless to point out the fact that continuity of action is very sure to give rise to phenomena that will not follow intermittence.

No drug exhibits in a more striking light both the physiological and the therapeutical differences between single and continued doses than alcohol. The partial, confused, and incomplete recognition of these differences by various observers and experimenters, who have examined and described the physiological action of alcohol, goes a great way towards explaining the various and often discordant results at which they have arrived. We learn from the experiments of Messrs. Lallemand, Perrin, and Duroy, as well as from those of Drs. Anstie, Parkes, Smith, Binz, and others, that the disappearance of a single dose of alcohol from the system, either by elimination from it or combustion in it, or by both processes, practically takes place in about six or eight hours after its ingestion. Traces of alcohol may be found in the blood and in the excreta for a much longer period than this ; but so much of it leaves the system within eight hours, that what remains of any single dose beyond this length of time has no real physiological value. A person who takes a dose of alcohol, in the shape of wine or other alcoholic liquid, once in each twenty-four hours, subjects his organism to the action of alcohol about one third of that time, and leaves it free from that action about two thirds of the same period. A person who takes what is known in non-scientific language as an "eye-opener" in the morning, wine with his dinner or lunch, a digester in the afternoon, and a

"night-cap" on retiring, takes the continued dose of alcohol. His blood is continuously charged with alcohol to a greater or less degree. There are phthisical patients who imitate this method of ingesting alcohol, and take a daily continued dose of it, keeping their blood charged with it more than two thirds of the time.

Alcohol taken in a single daily dose, by which the blood is practically free from it more than two thirds of the time, and alcohol taken in a daily continued dose, by which the blood is practically charged with it more than two thirds of the time, are substantially different drugs, which produce different physiological phenomena and are or should be employed for different therapeutical ends. This is not the time nor does it fall within the scope of this paper to describe these differences in detail. It is sufficient for my purpose to indicate their existence as illustrations of the single and the continued dose.

The bromide of potassium affords another and most pertinent illustration of the different physiological and therapeutical action which the single and the continued dose of an article may produce. I pointed out these differences in a comparatively recent monograph on the physiological and therapeutical action of the bromide of potassium, and will not repeat them here.[1] Illustrations of single and continued doses, and of the therapeutical importance of recognizing them as factors in the treatment of disease, might be multiplied indefinitely; but enough has been said to call your attention to them and to emphasize their importance. It was impossible to recognize and use them as separate therapeutic factors till physiological observation and experiment had discovered the time and method of the absorption and elimination of drugs, and the ratio of the former to the latter; nor can the practitioner apply them clinically till he knows, at least with approximate accuracy, the way every article he uses gets into and out of the system, the length of time it remains in the system, and its behavior while there.

The administration of medicines to the sick, without regard to the different and often opposite results, physiological or therapeutical, that follow the single and the continued dose, is both unsatisfactory and unscientific. It is unsatisfactory because it fails to secure the legitimate action of medicinal agents. It is unscientific, because it ignores some of the most important physiological conditions upon which scientific therapeutics rest. The time has come for the clinician to recognize and use these and other phenomena of the *modus operandi* of drugs which the physiologist has discovered and whose accuracy he has demonstrated.

Secondly, the *frequent dose* is the giving of a medicine so as to impart to the organism some one or more of its actions, whether primary or secondary, with great rapidity. It is hitting blow after blow in quick succession, upon some organ which it is desirable to affect, in

[1] Op. cit.

accordance with evident indications, with rapidity and power. It is usually, perhaps always, some action of a drug, manifested soon after its absorption, which it is desirable to obtain and which can be obtained by the frequent dose. Obviously the administration of the frequent dose is limited by the physiological behavior of the system under its influence. After a certain period the frequent dose is equivalent to a full single dose or to a toxic one.

The action of opium almost immediately after absorption illustrates the frequent dose. One of the earliest physiological actions of opium after its ingestion, rarely after subcutaneous injection, is stimulation of the nervous system, and of the circulation. This is fully recognized by obstetricians, who advise its exhibition as one means of controlling post partum hæmorrhage. Stimulation is a primary effect of opium that soon passes over, the length of time varying with the quantity given and with the idiosyncrasies of patients, into an opposite condition. The administration of an appropriate quantity of opium every five, ten, or fifteen minutes, that is, the frequent dose of it, will prolong and enhance its primary stimulant action. How desirable it sometimes is to prolong the primary stimulating action of this invaluable agent, I need not remind those who hear me.

The physiological action of aconite upon the human economy illustrates the same principle. Fleming's admirable observations upon aconite have taught us the powerful sedative influence that five drops of the tincture of the root exert upon the system. If, instead of giving five drops in a single dose, half a drop is given every half-hour ten times, or one drop every hour five times, a different physiological and consequently a different therapeutical result is attained from that of the single dose of five drops. In this case a less depressing sedative action is obtained by the frequent than by the single dose.

I will not weary you by these illustrations. I am sure your own observation at the bedside will add to these other and more apposite ones. The object of this paper will be attained if it succeeds in bringing clearly before you the great therapeutical power that results from the physiological adaptation of doses to the processes of absorption and elimination, and especially if it succeeds in calling your attention to the power of the continued dose.

ON EMPYEMA.

AN ANALYSIS OF THE CASES IN WHICH PUS HAS OCCURRED IN THE PLEURAL CAVITY, WHICH HAVE BEEN TREATED AT THE MASSACHUSETTS GENERAL HOSPITAL.[1]

BY WILLIAM F. WHITNEY, M. D.

Considered simply from a pathological point of view, the difference between pleurisy and empyema is one of degree and not of kind; for even in a serous effusion a few young cells can be found, and from this all stages can be traced to that in which they are so abundant as to form the fluid known as pus. From a clinical point of view, however, the character of the fluid makes a difference in the course and treatment of the disease, and it is from this point that the cases which have occurred at the Massachusetts General Hospital have been considered.

The same trouble is experienced in comparing these cases that is met in the comparison of any series of hospital cases, namely, that as a rule they occur among persons who have very little power of observation, and consequently their statements as regards the time they have been sick or how long certain symptoms have lasted are not always to be relied upon; moreover, after the patients have come under observation, the minuteness of detail varies with the individual who has charge of them, and consequently many of the points that are particularly desirable have not been noted at all in many instances. But even from these imperfect records there are to be obtained certain facts which are of importance in the classification of these cases, and also of some practical interest in reference to their treatment.

The number of cases in which the existence of a purulent fluid within the pleural cavity has been proved to exist is sixty-seven. They can be distributed among two classes: the first, those in which it is primarily an affection of the pleura, and any disease of the lung itself is subsequent; the second, those in which the trouble with the lung is primary, and the affection of the pleura is secondary.

The first series is the one to which the term empyema should be restricted, and presents two forms, the acute and the chronic. The first of these is not generally known, and the distinction between the two is not well recognized. But these cases appear to show clearly this distinction, although exception may be taken to the classification of some individual cases. In the acute cases the effusion is apparently purulent from the beginning, while in the chronic cases the effusion is probably at first serous, but later, from neglect of treatment or some unknown cause, it becomes purulent. Of the sixty-seven cases that have occurred, twelve were considered to be of the acute form. In four of

[1] A Thesis for the Degree of Doctor of Medicine.

the twelve cases, exposure to wet and cold was assigned as the exciting cause; in one, violence, causing fracture of ribs; but in the remaining seven there was no cause assigned. In all the cases, the onset was sudden; chills occurred in three instances; pain in the side, increased on full breath, and sooner or later dyspnœa, was the sequence of symptoms at first. In other words, symptoms of inflammation of the pleura were manifest. In the further progress of the case, especially if the termination was fatal, the symptoms became quite severe, delirium and signs of prostration having been observed. The temperature was taken in two cases, and varied from 101° (Fahrenheit), in the morning, to 103° in the evening. The signs obtained from auscultation and percussion showed merely the existence of a fluid, but of its nature, whether dense like pus or thin like serum, there was no way of determining by those methods. From this it appears that there is nothing truly diagnostic of pus, and it is only when the symptoms in a case of pleurisy are unusually severe that its existence is to be suspected.

As the result of the twelve cases, five died, five recovered, one was doubtful, and one is still under observation. The mortality occurred entirely in adults. The duration of the disease varied from thirteen days to nine weeks. In the very rapid cases the patients appeared to die from the intensity of the disease, while in those more prolonged they seemed to sink from exhaustion. In one case, death was apparently due to pressure of the fluid, for although the effusion was not very large (four pints) it was confined to the anterior and lower part of the chest, and so was able to exert as much pressure as a larger effusion. For Bartels has shown [1] that in effusion into the left pleural cavity, as was the case here, if the effusion is large, when sudden death occurs it is caused by bending the vena cava inferior at a right angle, and thus preventing the return of the blood to the heart, and not by directly paralyzing the heart, as was formerly supposed.

In three of the cases, no attempt was made to remove the fluid; they occurred before the time when puncture of the chest was a common practice. In the other two, paracentesis was twice performed in one, and once in the other, followed in the latter by a permanent opening; gangrene of the lung was supposed to have existed also, but it must have been secondary to the empyema, as no symptom of it was noticed before the existence of pus was detected.

The cases which terminated favorably occurred in children or young adults. From these it appears that the usual course of the pus is to find its way to the surface and discharge externally. In two of the favorable cases abscess had formed at the end of four and eight weeks, respectively. In one of these, after spontaneous opening, the discharge was allowed to come away at will, and no attempt was made to wash it

[1] Deutsches Archiv für klinische Medicin, iv., 1868.

out. Tonics were used internally and the case went on favorably. In the others, besides tonic treatment, the side was syringed out twice daily with a solution of tincture of iodine or carbolic acid. These patients were under treatment from four to eight months. In one only was there any complication, and this was a large abscess of the abdominal parietes; the symptoms at first resembled those of peritonitis, but later, pus pointing near the umbilicus, the true nature of the disease was shown, and on opening the abscess the symptoms were relieved.

The case which was doubtful in its termination was punctured once and was then removed from the hospital.

The case that is still under observation occurred in a child, and a permanent opening was made, from which there has been discharge for eighteen months. The general condition has somewhat improved, but the prognosis is as yet undecided.

The question of making a permanent opening in the chest is still discussed, but from these few cases it appears that those in which it was made terminated more favorably than those in which it was omitted. But here must be considered another important element, namely, the age of the patient; for all of the recoveries occurred in children or young adults, and this, as far as it goes, is of great importance.

The next series is that in which there was reason to believe that the effusion was at first serous and later became purulent. The proof that the disease of the pleura was the primary affection and the disease of the lung secondary, if any existed, is not always so clear in all the cases as could be wished, but it is considered that twenty-six belong to this series. The history shows that these cases differed in no way from those of chronic pleurisy in their course, and there is no way of proving the existence of pus, unless it points externally, except by means of paracentesis. In six of them, serum was first detected; and in the remainder pus was found at the primary tapping; but from the length of time during which the effusion had existed, it was to be presumed that the fluid was serous at the beginning.

The results of these cases are very unsatisfactory. Four died, two recovered, and the remaining twenty stayed in the hospital lengths of time varying from a few weeks to a year, but after that their history was generally unknown. All the four cases which terminated fatally had permanent openings, and in these daily injections, generally consisting of carbolic acid and water, were used. In twenty cases the result was death some time after leaving the hospital, or it was never known. The treatment in five of these cases was by paracentesis alone, and in all of these the patients left the hospital relieved, but the physical signs still showed the existence of fluid. The final result in all these cases was doubtful. In one, paracentesis was performed twelve times within eight months; in the other fifteen, there was either a spontaneous or an

artificial opening of the abscess, with subsequent fistula and discharge. In four, daily injections were used. In seven, the symptoms were relieved when the patients left the hospital; one is reported not to have died until ten years after leaving, although his condition was very poor when he left; one had a fistulous opening for five and one half years, with daily profuse expectoration; one recovered sufficiently to go on a whaling voyage, but died within two years after leaving the hospital. The other six patients were not relieved, but the result is not absolutely known.

In all these twenty cases the result was probably unfavorable owing to disease of the lungs, for it is generally accepted that in the majority of instances in which the lung is compressed for a long time, changes are developed of a chronic inflammatory character, which are fatal in their tendency. That such changes might readily occur in these cases is evident from the fact that in nine patients evidences of the presence of fluid had existed from one to six months before any attempt at removal, and in eleven from six months to two years. The majority of the patients were between twenty and thirty, at an age when disease of the lung is most common.

The two cases of recovery had the following history: —

I. December 15, 1858. The patient, a male, forty-eight years old, nearly ten years before had pleurisy in the right side; he was able to be about in two months afterwards, with a little cough and dyspnœa on exertion. These symptoms continued for four years, but the patient was able to attend partially to business; at the end of that time there was flattening of the chest, with evidences of effusion. Three months later the effusion seemed to have disappeared, and the man continued in good health for five years, when a fluctuating tumor appeared over the right chest, and signs of the existence of fluid were evident. Two months later an attempt was made to introduce a medium-sized trocar behind the tumor, but the effort failed from the narrowness of the intercostal spaces. The tumor was then opened, with a free discharge of pus. All this time he had slight cough, but no râles were ever detected. He remained in the hospital for a few weeks and was then discharged.

Sixteen years afterwards he was seen, and said that "his health had been good since leaving the hospital, the discharge had continued for eighteen months and at the end of that time had ceased, and he had had no trouble since, except some dyspnœa on exertion." His general appearance was healthy. His right side was contracted and dull on percussion; respiration was pure but faint. Slight lateral curvature of spine existed.

II. October 6, 1869. The patient was a male, fourteen years old. Four months before his entrance he had chills, fever, and pain in the left side; he felt better in a few days, was then taken worse, with dysp-

nœa and cough, and was confined to bed eight weeks. At the time of entrance, signs of a large effusion were noted; the heart was pushed to the right of the sternum, and a bellows murmur was heard. Nothing abnormal was detected in the right lung. A week afterwards, the first paracentesis was performed, and four pints of clear serum were withdrawn, with relief. In ten days the effusion again increased, and four and a half pints of serum were withdrawn. The urine was normal. Two weeks later effusion required a third removal of fluid, and three pints of serum were obtained. Four weeks later the fourth paracentesis resulted in two and a half pints of serum. Two weeks after, the fifth paracentesis gave the same quantity of serum as the fourth. One week later, two pints of serum, with a little pus, were obtained. One month after, the seventh paracentesis, with two pints of fluid. For a few days his general condition appeared to improve, but for the next three weeks it failed, and four weeks after the seventh, the eighth paracentesis was performed, four months after the first, and two pints of pure pus were withdrawn. A few days later two canulæ were inserted into the chest, the upper between the third and fourth ribs in front and the lower between the eighth and ninth on the side; the upper was removed after a few days, as it was found to be of no use. There was a slight discharge from the lower opening. Three days after, the patient was etherized and a large canula introduced. The pleural cavity was to be syringed daily with a solution of carbolic acid in water.

March 20, 1870 (five months after entrance), he was discharged with strength much improved. Faint respiration was heard down to the third rib in front and to the angle of the scapula behind. The heart was still at right of the sternum. The inner end of the canula became more and more elevated, apparently by the diaphragm. Pulse, 116. Temperature, 99.5°.

December, 1874, four and one half years after the last record, he wrote that he had used the syringe daily for six months after leaving the hospital, and then appeared to do well for three months, when there was a spontaneous discharge of two pints of pus, and after that he was perfectly well and had been able to do as hard work as ever. His spine was slightly curved.

Little need be said of the remaining class of cases, as they occur secondary to other troubles. They add to the gravity of the prognosis, and there is little hope of successful treatment. Of the twenty-nine cases that occurred, sixteen died while in the hospital, three are known to have died after leaving the hospital, and in the remaining ten the subsequent history is unknown, but from the condition in which they left the hospital, nothing but an unfavorable result could be anticipated.

From the results of these last two series, little is to be hoped in the majority of cases from operative treatment as a means of cure; but it

does certainly afford great temporary relief, and should be recommended where there is any doubt as to the disease of the lungs. But where pulmonary disease is clearly established, paracentesis should be preferred, as giving the patient less inconvenience with an equal amount of relief.

In the care of these cases, there have been suggested several points which are of practical interest. In one instance quite serious results appeared to follow the use of ether in order to produce insensibility. The patient became asphyxiated, and but for the prompt performance of tracheotomy would probably have died. As the asphyxia was relieved by tracheotomy, it appears to show that spasm of the glottis, rather than the ether, was the cause of the difficulty. That ether can be used with safety is shown by the fact that in the other four cases in which it has been used there have been no unpleasant results; one patient has been etherized five times, three times for openings into the chest, and twice subsequently, once to have a scrofulous testis removed, and again to have two fingers amputated for necrosis. Of course great care must be exercised in the administration of ether; it is found best to etherize with the patient in a sitting posture, as this gives the diaphragm the freest play.

After the introduction of the tube it is important that it should be kept in place firmly, that there should not be any pressure upon the wound, and that the tube should be so exposed as to be easily cleaned without having to move in and out, causing the passage to be irritated. Several shields have been devised for this purpose. But the one which answers these requirements best is a modification of the forms used here and at the City Hospital last year. A piece of sheet-tin about six inches long and three wide is cut in the form of an hour-glass. A hole is punched in the narrow portion, just large enough to carry the tube. A belt of thin sheet rubber is sewed to this shield, through small holes punched in its margin, and the narrow part is then arched over the wound. The belt is fastened round the body by means of buttons. Cotton wadding in a thin layer is placed beneath the belt and the ends of the shield. By this means the wound can be washed daily by syringing, and all the change necessary is to replace the cotton once a day.

The last and most important point is to keep the cavity thoroughly drained after it has once been opened. For a few ounces of decomposing pus will cause more hectic and constitutional disturbance than the amount previously inclosed in the cavity and protected from the air.

RECENT PROGRESS IN THE TREATMENT OF CHILDREN'S DISEASES.

BY D. H. HAYDEN, M. D.

Intestinal Catarrh of Children. — Dr. A. Monti,[1] instructor in the University of Vienna, makes the following recommendations for the treatment of infants affected with intestinal catarrh: —

The best substitutes for the mother's breast, when this cannot be obtained, are, veal-broth[2] and milk, Liebig's soup, Löflund's infant food,[3] Nestle's infant powder,[4] fresh cow's milk, according to the age of the child, given either pure or proportionally diluted, and condensed milk.

The author's experience is in favor of giving exclusively liquid food, and of avoiding the amylacea. In opposition to the advice of Vogel and others that milk should be entirely excluded from the diet of children affected with intestinal catarrh, if the trouble originated at the time of its use, the author, while admitting that good results are often obtained by stopping the milk for a few days in children over one year old, considers such abstinence in infants under three months of age injurious and a most frequent cause of collapse and death. When after weaning there comes on an intestinal catarrh ushered in with violent symptoms, or when the disease lasts a long time, and, notwithstanding proper dietetic and medicinal treatment, shows no signs of improvement, where the circumstances admit, the child must be returned to the breast. This is especially necessary when the child is under five months of age, and in the summer months. Where the cause of the trouble is due to the indigestibility of the cow's milk, this should be diluted with veal-broth in the proportion of one part of milk and two parts of veal-broth, for children under three weeks old; for children from one to two months old, cow's milk and veal-broth in equal parts; for children from two to three months old, two parts of cow's milk and one part of veal-broth.

The author has in many cases substituted condensed milk with advantage, using the following proportions: for new-borns, one part of condensed milk and fifteen parts of water; for children from two to four weeks old, one part of condensed milk and fourteen parts of water; for children from one to three months old, one part of condensed

[1] Wiener medicinische Wochenschrift, 1875, i.

[2] This is prepared with half a pound of veal and three pints of water boiled down to a pint and a half.

[3] Löflund's infant food is essentially the same thing as Liebig's food, but in the more convenient and concentrated form of an extract. The extract is prepared for use by dissolving it in warm milk.

[4] Nestle's infant powder, prepared after the idea of Liebig, contains also a good Swiss milk in the form of a concentrated and dry powder. It is made ready for use by stirring up with cold water, and then boiling for a few minutes.

milk and thirteen parts of water; for children from three to five months old, one part of condensed milk and twelve parts of water; for children from five to ten months old, one part of condensed milk and ten parts of water.

With older children (from eight months up to two years old) affected with chronic intestinal catarrh, when the disease is not benefited by withdrawing the milk for a few days, the author gives pure lukewarm milk, either as the exclusive diet or in connection with raw meat, and with surprisingly good results. He begins with a pint of lukewarm milk for the day, giving in addition water-gruel and raw meat. When this is well tolerated, he increases the milk gradually to a pint and a half, and then to two pints. With this treatment the author has repeatedly seen infants who were previously reduced to skeletons, within from eight to ten days not only cured of the intestinal catarrh but also increase a pound in weight.

In cases where neither veal-broth and milk nor condensed milk nor lukewarm milk, pure or properly diluted, causes an improvement of the intestinal catarrh, the author resorts always to a wet nurse. When this is not possible, one of the following substitutes is to be tried: Liebig's food (or one of its surrogates, as Löflund's infant food), given as exclusive diet, frequently produced successful results with children over five months old. The use of Nestle's infant powder was often equally successful, though with very young infants this is frequently not well tolerated. Cocoa and acorn coffee agreed often with infants over three months old, but only when used in connection with one of the above kinds of food. The acorn coffee is particularly advantageous for rhachitic and scrofulous children. For infants under a year old it is given according to their age, either with equal parts of milk or with one part of acorn coffee to two or three parts of milk. Of cocoa the author has generally employed the powdered seeds, free from oil. When the child is over one year old the cocoa or acorn coffee is prepared by boiling in pure milk.

As to the food that will agree best, this depends in a great measure upon the idiosyncrasy of the little patient; and when under one form of nourishment the intestinal catarrh does not rapidly improve, a change must be made to another, which may prove more suitable.

With infants between eight months and two years the author often uses wine, preferring red wine, and giving from one to two tablespoonfuls daily.

If collapse should suddenly set in in acute entero-catarrh, lukewarm bran baths once or twice daily should be used. These were often used, too, in cases of chronic intestinal catarrh where the skin became dry and scaly, in order to excite the metamorphosis of tissue and the circulation. Where the children were anæmic, baths containing iron or rock-salt or common sea salt were employed with good results.

The medical treatment employed by Monti is as follows:[1] —

In cases of simple entero-catarrh, for new-borns from three to six weeks old, —

℞ Tincturæ opii[2]	gtt. j.
Misturæ gummosæ	100,0.

Teaspoonful every two or three hours.

For sucklings up to seven or eight months, —

℞ Tincturæ opii.	gtt. j.
Misturæ gummosæ	70,0.

For infants from eight to fifteen months old, —

℞ Tincturæ opii	gtt. ij.
Misturæ gummosæ	70,0.

According to Monti's experience, tincture of opium should never be used when infants have been prematurely born, when very anæmic and run down, when affected with chronic hydrocephalus, or when there is a complication of bronchitis or pneumonia; for in such cases toxical effects are easily produced. On account of the different degrees of susceptibility to opium in infants, the author recommends to begin always with the above small doses and not to increase the dose until the first dose has proved to be of no effect. The parents must also be instructed to stop the medicine as soon as any long-continued drowsiness shows itself.

Of Dover's powder the author gives children under three months old 0.07 in from eight to twelve doses; when from three months to one year old, 0.07 in six doses; when two years old, 0.14 in six doses.

If with the catarrh there should be symptoms of dyspepsia, as vomiting and acid stools, the author combines with the opium an alkali, as:

℞ Pulveris Doveri	0,07.
Pulveris oculi cancrorum	2,00.
Sacchari albi	3,00.

Ft. pulv. et div. in part. no. viij. D. S. One powder every two hours.

Or:

℞ Sodæ bicarbonatis	0,60.
Aquæ fontanæ	70,00.
Tincturæ opii	gtt. j.
Syrupi simplicis	12,00.

D. S. Teaspoonful every two hours.

Where there is no vomiting, and undigested caseine is present in the stools, the author has obtained good results with paullinia and subnitrate of bismuth. For the former he writes as follows: —

℞ Paullinæ	0,80.
Pulveris Doveri	0,07.
Sacchari albi	3,00.

M. Ft. pulv. et div. in part. no. vj. D. S. One powder every two hours.

[1] The prescriptions are given according to the metric system, the unit, one gramme, being equivalent to about sixteen grains.

[2] Tinctura opii of the Austrian Pharmacopœia is one third stronger than that of the United States Dispensatory.

Where there is no dyspepsia the author uses astringents: —

℞ Tincturæ krameriæ . . . . . gtt. xx.
Tincturæ opii . . . . . gtt. j.
Aquæ fontanæ . . . . . 70,00.
Syrupi simplicis . . . . . 12,00.
D. S. Teaspoonful every two hours.

Or:

℞ Acidi tannici . . . . . 0,30.
Pulveris Doveri . . . . . 0,07.
Sacchari albi . . . . . 3,00.
M. Div. in part. no. vj. D. S. One powder every two hours.

When the intestinal catarrh is complicated with an acute gastric catarrh, and there is vomiting, the author gives an acid in combination with opium or a small dose of rhubarb: —

℞ Acidi muriatici diluti . . . . . gtt. ij–iij.
Syrupi simplicis . . . . . 12.
Aquæ destillatæ . . . . . 70,00.
Tincturæ opii . . . . . gtt. j.–ij.
D. S. Teaspoonful every two or three hours.

Or:

℞ Pulveris rhei
Pulveris Doveri . . . . . āā 0,07.
Sacchari albi . . . . . 3,00.
Ft. pulv. et. div. in part. no. vj. D. S. One every one or two hours.

When with the acute or chronic intestinal catarrh there is also a chronic gastric catarrh (loss of appetite, eructations, hiccough, coated tongue, and offensive breath), the author gives sulphate of zinc, colombo, rhubarb, the latter especially where the stools are colorless. Thus the author prescribes for children under one year of age, —

℞ Zinci sulphatis . . . . . 0,07.
Aquæ destillatæ . . . . . 70,00.
Tincturæ opii . . . . . gtt. j.
Syrupi simplicis . . . . . 12,00.
M. D. S. Dessertspoonful four or five times daily.

Or:

℞ Pulveris rhei . . . . . 0,20–0,40.
Pulveris Doveri . . . . . 0,07–0,14.
Sacchari albi . . . . . 3,00.
M. Ft. pulv. et div. in part. no. vj–viij. D. S. Four to six powders daily.

Or:

℞ Decocti radicis calumbæ . . . . . 70,00.
Tincturæ opii simp. . . . . gtt. ij.
Syrupi simplicis . . . . . 12,00.
M. D. S. Teaspoonful every two hours.

When with the intestinal catarrh there is a complication of a light bronchial catarrh, the author gives an infusion of ipecac with small doses of opium.

In chronic intestinal catarrh experience has convinced the author that not much can be effected by medicine. For anæmic children, on the contrary, iron often effects wonderful results; yet even of this

medicine he cautions against giving too large doses. The preparations most commonly used by him are, —

℞ Ferri carbonatis saccharatis
Pulveris Doveri . . . . . ää 0,07.
Sacchari albi . . . . . 3,00.
M. Ft. pulv. et div. in part. no. vj. D. S. Two to four powders daily.

Or:

℞ Ferri oxydati dialysati[1] . . . . . gtt. x.
Aquæ fontanæ . . . . . 100,00.
Aquæ menthæ
Syrupi simplicis . . . . . ää 6,00.
D. S. Four to six dessertspoonfuls daily.

Or:

℞ Liquoris ferri perchloridi . . . . . gtt. vj.
Misturæ gummosæ . . . . . 100,00.
Syrupi corticis aurantii . . . . . 12,00.
D. S. Three to four dessertpoonfuls daily.

The author never employs clysters in catarrh of the small intestines. For the relief of colic and to quiet excessive peristaltic action in acute intestinal catarrh, Priessnitz's water dressings over the bowels do good service. In chronic cases, when meteorismus is excessive, cold water dressings frequently changed are useful.

Case of Erysipelas Migrans with Recovery, in an Infant four weeks old. — Dr. Christian Lutz[2] reports the case as follows: The mother of the child died of puerperal fever. The disease began on the right side of the scrotum, starting from an abscess of the size of a hazel-nut, caused probably by an intertrigo. The disease invaded first the anterior and lateral portions of the right hip, extending gradually down the thigh, leg, and foot. Later it made its appearance upon the right shoulder, and wandered downwards over the fore-arm and hand. It then reappeared (the sixteenth day of the disease) upon the right hip; it remained stationary here for some time, and then crossed over to the left hip, where it again became stationary. It then (from the nineteenth to the twenty-second day) extended down the left lower extremity, and on the twenty-third day appeared upon the back, advanced toward the left shoulder, remained stationary until the twenty-sixth day, and then extended down the left arm. On the thirty-first day, the erysipelas was confined to the back and fingers of the left hand, and all fever had ceased. On the thirty-second day the erysipelas had entirely disappeared, having lasted one month. During the course of the disease, there was a large abscess opened in the right thigh, one smaller one in the right calf, one over the internal malleolus, two over the back of the foot, and one over the patella.

The special treatment consisted of baths, which were begun on the

[1] A German preparation consisting of liquor ferri perchloridi, and holding an excess of hydrated sesquioxide in solution.

[2] Deutsches Archiv für klinische Medicin, August 14, 1874.

fourth day of the disease, the temperature on this day, taken in the rectum, being 104°. The baths were given three times in the day and once in the night, at a temperature of 95° Fahrenheit, cooled down to 81.5°–84°, sometimes only to 86°. Their duration was from five to seven minutes.

The local treatment previous to this had been simply inunction of lard and covering the parts with cotton-batting. In place of this, on the sixth day carbolic acid in sweet oil (one part to twenty-five, later one part to ten) was substituted.

The nourishment consisted of diluted milk and malt extract, with occasionally a few drops of port wine. When the temperature reached a very high grade four to five grains of quinine were administered, divided into three powders, and given in rapid succession.

The temperature as a rule was high throughout the whole course of the disease, varying from 101.5° to 104°. On the few exceptional days when the temperature was below 100.5°, the baths were stopped, and the ordinary warm baths given.

The bilious diarrhœa, which according to Widerhofer[1] shows itself in the erysipelas of new-borns, whether the disease be of pyæmic or local origin (in the former case at the beginning, in the latter at a later stage), did not exist in the present case. The patient became very much emaciated, but appetite and digestion continued good.

In an infant four weeks old, for whom under normal conditions the external application of considerable warmth is required, these cooling baths must exercise a powerful effect. The high fever nevertheless was looked upon as a sufficient indication for them, and their effect was always to lower the temperature 1.75°–2.5° for four or five hours. When taken out of the bath the child shivered violently; once it had a long hiccoughing attack; once also it had opisthotonos. This lasted, however, but a short time, and did not recur; but it was regarded as a warning not to reduce the temperature of the baths any more.

The recovery of the patient shows that youngest infants can be subjected to the antipyretic treatment of cool baths with good results.

The local treatment with carbolic oil had an unmistakably favorable influence upon the course of the disease. The surfaces were freed earlier of the eruption, the erysipelas did not reach such a degree of intensity, and after its employment was begun there were no more abscesses formed. It did not, however, prevent the extension of the erysipelas. The carbolic oil, of the strength of 1:10, is scarcely at all painful, and the author is in the habit of using it for intertrigo in children with good results.

Quinine in the Treatment of Children's Diseases, especially in Fevers and in Whooping Cough. — Dr. Rapmund,[2] from large experience in

[1] Jahrbuch für Kinderheilkunde, vi. 1.

[2] Deutsche Klinik. Schmidt's Jahrbücher, No. 3, 1875.

country practice, gives to quinine a decided preference over the use of cold water as an antipyretic, for the reason that the use of the latter cannot so well be controlled, and because internal remedies are less objected to by the laity than others. The author's experience with quinine as an antipyretic and tonic corroborates fully the favorable statements of Dr. Hagenbach upon this subject.[1] It has been employed by him in cases of scarlatina, measles, varioloid, erysipelas migrans, lobular pneumonia, and follicular enteritis. In the first three classes of disease the treatment was resorted to only in severe cases; for in light cases in country practice medical assistance is not called in. In the above cases quinine worked too as a hypnotic (Jürgensen), and convalescence was rapid.

In erysipelas migrans, Vogel has already recommended quinine as the only remedy acting favorably in the few cases of recovery seen by him.

The result in lobular pneumonia was a particularly favorable one, in nine cases between four months and eighteen months of age only two dying. This is explained by the author as due to the fact that in fatal cases the cause of death is an insufficient action of the heart, occasioned by the high fever. The remedy must be used without intermission; but when cyanosis has set in, it is too late. Dyspnœa is also relieved by this remedy. At the same time as much nourishment as possible must be given, — milk, meat broths, or wine. In enteritis folliculosa, where there was high fever, this remedy did good service, acting also as a tonic. In whooping-cough, quinine produces a decided diminution in the number of attacks and in their severity.[2]

In the author's cases thus treated there were no complications nor sequelæ, except where these had already made their appearance before the administration of the remedy; and they moreover were shortened in their duration or removed by the remedy.

The author always gives quiniæ murias in solution, 0.05–0.1 gramme once or twice daily in glycerine and water, equal parts. The medicine is given in black coffee. When not tolerated by the stomach, it was given in double the dose by the rectum. The syringe in such case should not hold more than an ounce or an ounce and a half of fluid.

[1] Boston Medical and Surgical Journal, February 6, 1873, page 132.

[2] Boston Medical and Surgical Journal, August 7, 1873, page 133, and February 6, 1873.

PROCEEDINGS OF THE BOSTON SOCIETY FOR MEDICAL OBSERVATION.

EDWARD WIGGLESWORTH, JR., M. D., SECRETARY.

Cerebral Myxoma. — Dr. Webber presented a cerebral tumor which the microscope showed was composed of round and fusiform and processed cells, with fine fibres. The growth was probably a myxoma. It was from a patient of Dr. Arnold, who reported the case as follows: The woman, aged fifty-nine years, passed her grand climacteric six years ago. Disease of the ears had existed since childhood, but was not immediately attributable to scarlet fever. Three years since, the patient had a protracted and prostrating illness, with tedious though good convalescence. For the past two years the general health has been unusually good. Towards the end of January, 1875, exposure to severe cold, after being over hot suds, brought on a sharp attack of illness characterized by severe congestion of the membranes of the fauces, posterior nares, and auditory apparatus, followed by inflammation of this last throughout its entire extent, especially upon the left side. A chilly sensation in the right hemisphere succeeded, and increased steadily until March 19th, at which time it was intense.

March 26th. Partial paralysis ensued, at first of the left hand and arm, then of the left leg, and, this increasing, finally of the muscles of the face, of deglutition, and of the organs of speech. The pupils were not affected.

April 4th to 7th. Patient semi-comatose; no nourishment taken. Subsequently food and drink were swallowed. The left foot responded to the stimulus of tickling, the patient's senses returned, and she conversed freely. This amelioration of her condition lasted from three to four days, then the paralysis gradually increased until she died, April 15th. The pulse during this time was rarely above 90, the respiration was not accelerated until the last four days, and the temperature was but slightly elevated.

Autopsy. Four and a half hours after death. Rigor slight. Body yellow. Lungs generally adherent, slight cicatrices at apices and some condensation of the posterior lower lobe of the left lung. Heart's tissue moderately firm, valves healthy; a few soft clots in the right side. Liver firm and normal in substance; gall-bladder full of bile. Spleen normal. Left kidney soft, normal, capsule slightly adherent; right, rather smaller, with very adherent capsule; cortical substance of about the natural thickness. Genital organs normal, but retroversion of the uterus.

Brain, nearly normal in substance. Dura mater somewhat thickened. A small patch of thickened membrane between the pia and dura mater. Considerable atrophy of the convolutions of the left side; those on the right, posterior to the fissure of Rolando, flattened, and just above the fissure of Sylvius bulging as from internal pressure. Nothing abnormal at the base. The first thin section from the vertex showed, on the right, a yellow color, on the left one more than usually pink. Deeper sections under the most prominent point showed congestion and prominence of the vessels. A vertical section at this point disclosed a tumor, two inches in diameter, containing a yellowish serum,

apparently composed of a reticulum of fibrous tissue containing small cells filled with the serum. Around the tumor was a thin layer of irregular outline, from one to three lines in width, of congested tissue with numerous small but distinct and interlacing blood-vessels.

The right meatus auditorius externus was normal. The membrana tympani was slightly thickened. There was congestion of the mucous membrane of the tympanum. No implication of mastoid cells was observed. The left membrana tympani was thickened and opaque. The mucous membrane of the tympanum was thickened throughout the cavity and gave evidence of old inflammation. Both Eustachian tubes were pervious; the tegumentum tympani was very thin, almost transparent; it was not the result, however, of disease. The membrane overlying the tegumentum tympani was normal.

Cancer of the Pylorus. — Dr. Vogel showed a specimen of scirrhus of the pyloric extremity of the stomach reducing the size of its orifice so that a No. 4 probe was barely admitted.

Retinitis in Bright's Disease. — Dr. Wadsworth read a paper upon this subject,[1] and, in answer to Dr. Hay, said that separation of the retina was rare. He had seen but the one case referred to. Von Graefe in 1860 had seen one case, Donders in 1865, one; Bucht about a year since observed separation in both eyes.

Dr. Hay mentioned a reference in a recent number of the *British Medical Journal* to the simultaneous occurrence of signs of Bright's disease in the retina and of chronic enlargement of arteries and diplopia. He had observed a case with enlarged temporal arteries and diplopia. The heart was not particularly enlarged. The kidneys were said to be diseased.

Dr. Jeffries remarked that in Magnus's summing up, the debility was attributed to loss of albumen, and consequently individuals were differently affected. In such cases the trouble in the eye would occur when the loss begins to tell upon the constitution.

Dr. Wadsworth responded that some cases lost much albumen, and even died of the disease, without retinitis.

Dr. Jeffries thought that when patients broke down any length of time before death, the retinitis might occur.

Dr. Webber inquired if there were any peculiar character to the blindness; also, if the fatty degeneration and nerve-fibre changes depended upon changes in the arteries and thickening of their walls.

Dr. Wadsworth replied that the blindness was simply a dimness of vision, and that fatty degeneration might occur in other forms of retinitis, though most common in Bright's disease, this last being one of its most frequent causes; the change was in the walls of the arteries.

Dr. Lincoln asked if a certain form of retinitis might not be due to interstitial nephritis.

Dr. Wadsworth answered that it might, as syphilis, leucocythæmia, or a cerebral tumor might be a cause.

Dr. Fitz wished to know if any difference existed between the retinitis from Bright's disease and that from other diseases of the kidneys, sufficient for purposes of differential diagnosis.

[1] To be published in full in the Journal.

Dr. Wadsworth answered that a large hæmorrhage might occur in chronic forms.

Dr. Fitz suggested that this might also arise from an enlarged heart.

Dr. Bolles referred to the possible connection between cerebral hæmorrhages and apoplexy of the retina in Bright's disease.

Dr. Wadsworth stated that in any form of retinitis anything more than a slight difference is called a hæmorrhage. If there is a large hæmorrhage in the retina, there is more likelihood of one in the brain.

A Case of Tetanus. — Dr. Warren reported a case of tetanus. January 20th a laboring man was injured by the falling of a bank of frozen earth. The thigh, tibia, and metatarsal bones of the right lower limb were fractured, and the skin and superficial layer of muscles of the right fore-arm were severely lacerated and mixed with gravel. The wound in the arm having been carefully cleared of all débris, the divided ends of the radial artery were found and secured. The median nerve was exposed thoughout the whole length of the wound, and was separated from the neighboring parts. Externally it was somewhat begrimed at points, but did not appear to be seriously bruised. The power of motion having been previously ascertained to be good, the nerve was allowed to remain. The arm being flexed, the edges of the wound were approximated and carbolic acid dressings were applied.

The patient's condition was very favorable for nearly a week. On the 29th the ligatures came away, the sutures having been removed previously, and the wound was covered with healthy granulations. There was some pain, however, on this day, in the thumb and index finger. On the 31st the patient complained of a stiff neck. The characteristic symptoms of tetanus supervened, and in spite of opiates, hot vapor-baths, and ice to the spine, the patient died on February 2d.

Nerve Changes at the Point of Injury. — The median nerve was removed by Dr. J. J. Putnam, who found evidence of degeneration in it, varying from almost entire absence of nerve-fibres at the point of greatest inflammation in the middle of the fore-arm, to simple breaking up of the myeline, with preservation of the axis-cylinders in the middle of the upper-arm, as well as in the ulnar nerve in the fore-arm. At the point of greatest inflammation above mentioned, there was nothing to be found except thickened connective tissue, granular débris, and fat in small drops, often occurring in streaks as if substituted for the nerve tubes. Pieces of the brachial plexus showed evidences of degeneration of the myeline at some points, presumably those in continuation with the median nerve. No further examination was allowed.

Dr. Warren then exemplified upon the blackboard the changes which had been found in the median nerve high up in the arm. A portion of this was exhibited with a piece of a normal nerve for purposes of comparison. The spinal cord was not examined. Hæmatoxylin was preferred to bring out the nerve-cells. Wherever connective tissue exists, its cells, though latent or quiescent, may be brought out by any irritation, as, for example, inflammation. In this case, the thickened, inflamed connective tissue had caused a very marked increase in the apparent size of the nerve.

Dr. Webber spoke of Lockhart Clark's examinations of the spinal cord,

and said that the present specimen of the median nerve, if taken from the seat of injury, was interesting as showing local lesions not often observed. Changes might possibly be attributed to pressure from the surrounding connective tissue.

Action of Chloral Hydrate. — Dr. Warren then gave some account of the present methods of treating tetanus with chloral,[1] under small doses, by means of intra-venous injections, at the Massachusetts General Hospital. No patient had recovered.

Dr. Jeffries inquired if any records of the pulse or of the heat of the body had been kept during the long sleep occasioned by chloral.

Dr. Warren said that such could be found in the *Bulletin de la Société de Médecine de Gand.*

Dr. Jeffries then asked if any local pain at the point of the injection of the vein, and due to the distention, was present after the sleep had terminated.

Dr. Warren said it was not observed, and, in response to Dr. Chadwick, added that operations had been performed without causing pain even where the loss of consciousness in the patient had not been complete; that there was also no snoring nor subsequent vomiting.

Dr. Chadwick thought that if the anæsthesia were due to the action of chloroform, and yet unaccompanied by vomiting, this latter when occurring after chloroform narcosis could hardly be due to any specific nature of the drug itself. He also inquired what advantage was derived from intra-venous injections rather than from administration by the mouth or rectum.

Dr. Warren replied that subcutaneous injections afforded a more intimate way of introducing the agent; that in tetanus, the locked jaws offered an obstacle to its exhibition by the mouth; and that clysters involved too much motion of the patient, and might also cause spasm.

Dr. T. B. Curtis spoke of a case, reported in the *Gazette Hebdomadaire*, where one gramme per minute had been injected for five minutes. Asphyxia resulted, electricity failed, the patient died before the completion of the operation.

Dr. Warren alluded to the fact that twenty-two previous cases had been successful, and stated that half a drachm was the usual dose given here by the mouth, and that one drachm was called large; also that the deaths in cases reported were from the large doses.

Dr. Webber thought that the cases of death which had occurred in this neighborhood had generally followed doses of under twenty grains.

Dr. Curtis called attention to the fact that it was by no means established that the action of chloral is necessarily that of chloroform; that the resemblance exists in the laboratory rather than in reality, and the action of chloral must be studied by itself. The doses administered in England are also small, beginning with ten grains.

Dr. Richardson mentioned a case where a drachm, in delirium tremens, had caused death.

Dr. C. F. Folsom had seen abroad a fatal case from forty grains of chloral. At the same time, in Berlin, Küster saw one from thirty grains. Here in

[1] See the report on Surgery of this Journal, June 24, 1875.

Boston, Dr. Folsom had seen fifteen-grain doses given at intervals of five hours until forty-five grains had been administered, and the patient recovered with difficulty. The deaths in the two cases mentioned took place within half an hour from the time of the administration of the drug.

THE NEW ORLEANS PROTECTIVE ASSOCIATION.

The physicians of New Orleans have recently formed an association, the object of which is to protect the profession against the practice of working by contract for families or associations. The competition and underbidding have reached such a point that a reform has been called for, and Dr. Joseph Holt, who has occupied the position of physician to the Fireman's Charitable Association, has taken the lead in the movement, and has resigned his position. His salary was seven hundred and fifty dollars a year, but the work performed by him is estimated at ordinary rates to have amounted to five thousand dollars. Dr. Holt seems at present to be the recipient of much abuse for his action, if we may judge from accounts given in New Orleans papers. A physician has been found to accept the position left vacant by him; but the movement appears to be well organized, and, as the evil is one which has been much complained of in the South and West, is deserving of success. The small income which the profession receives for its services must be seriously diminished if such practices are allowed to continue without restraint.

THE EFFECTS OF ARCTIC COLD.

Some extracts from a paper on the influence of Arctic cold upon man, read before the Geographical Society of Vienna by Lieutenant Payer, are contained in *L'Union Médicale* of June 24, 1875. The explorer with his companions undertook a journey, March 14, 1874, in a sledge upon the glacier of Sannklar, to make observations on the land Francis Joseph. The cold had reached that day to 40° (Réaumur) below zero. Before sunrise, M. Payer and a Tyrolese had started out, in spite of the cold, to make observations and to sketch. The sunrise was magnificent. This luminary appeared to be surrounded by many small suns, and seemed the more brilliant on account of the extreme cold. The travelers were obliged to drink their spirit-ration without touching the edge of their glasses; contact with them would have been as dangerous as if they had been red-hot. But the spirit had lost all its stimulating properties and fluidity. It was insipid and as thick as oil. It was impossible to smoke cigars; they became only a piece of ice in the mouth. Metallic instruments had the same effect, when touched, as red-hot iron, as had also the medals which some of the travelers imprudently wore on their breasts. Cold of the severity here alluded to paralyzes the will, and under its influence one

becomes like an intoxicated person, because of the uncertainty of his movements, his stammering speech, and the slowness of his thoughts. Tormenting thirst is produced by the evaporation of the humidity of the body. Snow cannot be taken to counteract this, for it causes inflammation of the throat, palate, and tongue; furthermore, one could never swallow a sufficient quantity of it to quench his thirst. A temperature of 30° to 40° below zero gives to snow the taste of molten metal. Eaters of snow become enfeebled, as do opium consumers in the East. The companies of travelers who journeyed over the snowy plains were enveloped in thick clouds of vapor formed by the evaporation from their bodies, which took place in spite of their clothing of furs. The vapors fell to the earth congealed in the form of little crystals, and made a slight crackling; they rendered the atmosphere impenetrable, and obscured everything. In spite of the humidity of the atmosphere there was a disagreeable sensation of dryness. Every noise was transmitted a great distance; ordinary conversation could be heard distinctly a hundred paces off. M. Payer attributes this phenomenon to the great amount of moisture in the Arctic atmosphere. Food could be cleaved and mercury made into balls. Taste and smell were much diminished. Strength yielded to the paralyzing influence of the cold; the eyes closed involuntarily and became frozen. When one stood still, the soles of the feet became benumbed. Curiously, the beard was not frozen, but it was because the expired air fell, being at once transformed into snow. Dark beards became lighter-colored; the secretions of the eyes and nose were augmented, while perspiration wholly ceased. The only possible protection against the cold was to dress as warm as possible and to endeavor to hinder as much as possible the condensation of the evaporation. Greasing or blackening the body was of no value.

MEDICAL NOTES.

— We learn from our English exchanges that the medical council has been called upon by the government to express an opinion on the question of recognizing women as practitioners of medicine. After a somewhat lengthy discussion the following motion was passed: —

"The medical council are of opinion that the study and practice of medicine and surgery, instead of affording a field of exertion well fitted for women, do, on the contrary, present special difficulties which cannot be safely disregarded, but the council is not prepared to say that women ought to be excluded from the profession."

While the council did not feel prepared to justify the legal exclusion of women, it made no secret of its opinion that the profession as a calling is most unfitted for them.

— The American Ophthalmological Society met at the Aquidneck House, Newport, R. I., Thursday, July 23d. Thirty-one members were present. A large number of papers were read and discussed. The society was in session Thursday and Friday, and adjourned Friday afternoon to meet in executive session September 11, 1876, the day before the International Congress of Ophthalmology, in New York.

— At a meeting of the Société de Biologie, reported in the *Gazette Hebdomadaire* for July 9th, M. Bourneville communicated a very remarkable observation. We will recapitulate it in some detail on account of the interest which it presents. It is about a woman forty-six years of age, who, having been well up to the twenty-third year, had at that time (1854) a startling sensation, a fright; the following year she had her first attack of hystero-epilepsy; she fell in the fire and had her body burned. She met with like accidents in 1859, 1860, 1863, and 1865.

Having entered the hospital Sainte Eugenie, she had the cholera in 1866. After this time her urine was suppressed for eight days; it reappeared, but she had to be catheterized daily until May, 1875. After having met with various accidents, she entered the Salpêtriere in 1869. There she had many hystero-epileptic attacks followed by contractions of the upper and lower limbs, contractions which at different times diminished, were partially cured, reappeared, and became permanent in different parts.

Cutting short the history of her sickness we come to May 17, 1875. At noon on this day she had a hystero-epileptic attack, preceded by an aura, with ovarian and anal pains shooting to the epigastrium, to the neck and temples; the attack was accompanied with cries, turning of the eyes, and a distorted countenance, which became cyanotic; the right arm was flexed and fixed on her back for three hours. On the 18th of May she was in the following condition: she had contraction of the four limbs, complete anæsthesia, double amblyopia, and a contraction of the jaws; she became speechless; she had neuralgic attacks, for which she was given injections of morphia. This state persisted without marked change until the 22d of May, when she had a new attack and in eight hours she was completely cured.

So it happened that there disappeared in a short time a retention of urine which had lasted since 1866, a contraction of the left arm and leg which dated from 1869, a contraction of the jaws that required the aid of a tube for sustenance for ten months, and an aphonia for a like period.

M. Charcot, in 1870, made the following prognosis: "It is possible that in spite of its long duration, this contraction may disappear without leaving traces; perhaps to-morrow, perhaps in some days, perhaps in a year; we can prognosticate nothing on this point. At all events, if recovery occurs it may be sudden. From one day to the next everything may return in its proper order, and if it is found that at any time the hysterical diathesis is lost, she will return to her normal state."

— A modification of Dr. Rutherford's freezing microtome is described by Dr. Heming, in the *Lancet* of June 19th. The manner of employing it is as follows: The substance to be cut is placed in the cylinder, about half an inch from the top, imbedded in scraped potato, muscle, brain-substance, or other suitable material. The tube is connected by an India-rubber tube with a worm of block tin immersed in a freezing mixture, and placed a few inches higher than the section-cutter. The other end of the worm is connected with a large funnel suspended above. An India-rubber tube is adjusted and led into a suitable receptacle. Into the funnel is now poured a quantity of weak spirit, just strong enough not to freeze at 0° F. (one part methylated alcohol and two parts water are sufficient). This of course runs through the

worm, and is thereby reduced to a low temperature (say 10° F.). Then it fills the chamber, running in as we saw at the lower tube, and out at the upper tube into the vessel placed for its reception. As soon as most of the spirit has come through, the India-rubber tube conveying it away is compressed, and the contents of the vessel are returned to the funnel (this time at a very low temperature). After this has been repeated a few times (in about fifteen minutes) the sections may be cut with a razor with perfect facility.

— We learn from a contemporary that Madame Brès is the first French lady who has taken a medical degree in Paris. She passed all her examinations in a most creditable manner, and M. Wurtz, the president of the examining board and dean of the faculty, addressed her in the following terms: "Madame, you have not only raised women from the secondary position they have held in medicine, but your thesis is one of the best that the faculty of Paris has ever received, and it will be consigned with honor to its archives." The title of the thesis is "La Mamelle et l'Allaitement," a very appropriate subject for a doctress; it is treated in an anatomical, a chemical, and a physiological point of view. We learn, also, that Mrs. J. K. Tout, of Toronto, has passed her examination at and obtained a license to practice from the College of Physicians and Surgeons, Ontario. Mrs. Tout is the first lady who has obtained a license to practice medicine in all its branches in Ontario.

— According to the London correspondent of the *American Medical Weekly*, Professor Lister, in continuing his remarks on recent advances in antiseptic surgery, gives a formula for ointment of boracic acid, which he has found very efficacious: Boracic acid finely levigated, 1 part; white wax, 1 part; paraffin, 2 parts; almond oil, 2 parts; melt the wax and paraffin by heating them with the oil, and stir the mixture briskly, along with the boracic acid powder, in a warm mortar till the mass thickens; this is afterwards to be reduced to a proper consistence by rubbing down about an ounce at a time in a cool mortar. He spreads the ointment very thin on a fine muslin or linen rag, which absorbs some of the almond oil and leaves a layer of blended wax and paraffin flexible at the temperature of the body, and separable from the skin easily by means of the discharge, which is thus not confined beneath it. This prevents putrefaction, while it does not hinder cicatrization.

LETTER FROM LONDON.

Messrs. Editors, — London has now observed its annual Hospital Sunday for the third time. The idea of asking for collections on a fixed day, for the support of hospitals and dispensaries, is an old one in the provinces, and its introduction into the metropolis has thus far been attended with marked success, and all the medical men with whom I have spoken upon the subject heartily commend the practice. The weather last Sunday was decidedly unfavorable, but the receipt of about £10,000 has already been acknowledged at the Mansion House. For several weeks preceding the 13th inst., posters calling the attention of the public to the subject were displayed on the hospi-

tals, churches, railway stations, etc., and appropriate sermons were preached by the clergy generally on that day. The lord mayor and the corporation attended the morning service at St. Paul's, arrayed in their imposing robes of state, and in the afternoon they went to Westminster Abbey. If as earnest efforts should be made to have the day an important one in Boston, doubtless more money would be collected in that city than there has been heretofore.

It is said there are something like one hundred and thirty-five religious sects in England and Wales. The followers of one of these, calling themselves the Peculiar People, have gained a certain degree of notoriety of late. They contend that when a man, for example, is ill, he should be anointed with oil and then be prayed over, leaving the result to Providence. This course was pursued last week with a child suffering from pleurisy. The little patient succumbed to the disease, and the father was arrested and fined for not calling in a medical man. These Peculiar People have advertised that they will soon occupy a house of twenty rooms (that was formerly used as a homœopathic hospital), on Town Street, as a hospital, and that the inmates will not receive any medical treatment. If the authorities do not interfere, it seems highly probable that the solution of Sir Henry Thompson's "prayer-gauge" question will be attempted in the city from which it emanated!

To a New Englander, on revisiting England after a lapse of several years, in which time there has been a "re-introduction of ether," it is somewhat gratifying to see how generally this anæsthetic is being used in the hospitals. That chloroform is more or less employed in private practice I know from the fact that one gentleman whom I am acquainted with acts as a chloroformist. I know also that he gets a guinea every time he administers the agent! Ether is used daily at Moorfields, and it is given much as we give it. Mr. Critchett prefers to have his patients inhale a little chloroform before inhaling the ether, as he thinks they take to the former more readily. At the Middlesex Hospital ether is given through an apparatus, and it seems to me that the patients are longer in becoming insensible than when a sponge is used.

I. C.

London, *June* 17, 1875.

HORSE-HAIR FOR SUTURES.

Messrs. Editors, — I desire to call the attention of the profession to the value of horse-hair for sutures. I am aware that it has been used to some extent by a few practitioners, but I believe it needs only a fair trial to introduce it into general favor among surgeons.

Its use is not original with myself, nor do I know to whom the credit is due. I found it employed in Long Island College Hospital when I became a member of its faculty, and during the two years that I was connected with that institution it was often brought into requisition; principally, however, in stitching scalp-wounds. Since that time I have used it extensively in a great variety of wounds, and with the greatest satisfaction. In fact, I am inclined to think it may profitably supersede all other material for sutures, except where greater

strength is required. It is so fine as to leave no scar and to allow the sutures being introduced very near together, perfectly non-irritant, if properly prepared, is more easily tied than any other material, and, contrary to what I had supposed, not inclined to slip while tying the second knot. Those who have tested it find its strength is remarkable, sufficient at least for all ordinary tension. I have applied the hair stitches in almost every locality, both in the skin and in the mucous membrane, and I have never secured such beautiful, delicate linear scars with any other article.

Where greater strength is needed for the general support of flaps, silk or silver-wire may be used for that purpose, and the hair for accurate coaptation of the edges. I seldom use more than a single hair, although it may be doubled if desired. I take the long hair from the tail of a young, healthy horse, and first thoroughly rinse it in warm water. I then boil it for a half-hour in soda-water (about an ounce of bicarbonate of soda to two quarts of water). I remove and rinse it in clean warm water, and it is ready for use. This process renders it perfectly innocuous and gives it the right degree of pliability. One pleasant feature about it is that it does not snarl or kink. Twisted in a rope or double coil, a single strand is easily drawn by seizing the middle.

Most of my friends, to whom I have spoken of and shown its application, have expressed surprise if not doubt at first, but have been, without exception, delighted with it upon trial.

In my next case of vesico-vaginal fistula I intend using it, either tying it or confining with perforated shot. This will be a severe test, and I am not over-sanguine as to the result. I may add that it would be better to have needles smaller than any now made for carrying the single hair, so that it may more accurately fill the hole. Yours sincerely,

WM. WARREN GREENE, M. D.

PORTLAND, *July* 15, 1875.

BULLET-WOUND OF THE STOMACH AND KIDNEY.

MESSRS. EDITORS, — On the night of May 29th, W. F. D. received a wound from the discharge of a pistol carrying a one thirty-second ball, penetrating at a point over the cardiac portion of the stomach; dipping downward, the ball passed through the region of the left kidney, and lodged beneath the muscles of the back, from which I extracted it the following Monday morning, May 31st. When I first saw him he had profuse hæmatemesis, which kept up until the next morning; I treated him with ice in the mouth, which he was directed to allow to dissolve and to swallow; also subcutaneous injections of morphia. Since the 31st he has not had any return of the vomiting, but the most alarming symptom has been hæmaturia. The first week I allowed him only milk and water for nourishment, keeping him as comfortable as possible with morphia, afterwards a limited amount of beef-tea, milk, and custard; I gave him also two-grain doses of quinine. There has not arisen any symptom of peritonitis, and the pulse has gradually declined from 125 to 74;

there is every prospect of a good result, the only unpleasant feature being the hæmaturia, which is intermittent. For the hæmaturia the treatment is gallic acid, at the same time keeping up his strength with nutrients and quinia. He has sufficiently recovered to ride out, June 10, 1875, so that a good recovery is insured. Not a particle of blood has appeared in the urine for a week.

M. E. Jones, M. D.

Pittsfield, Mass.

COMPARATIVE MORTALITY-RATES FOR THE WEEK ENDING JULY 24, 1875.

	Estimated Population.	Total Mortality for the Week.	Annual Death-rate per 1000 during Week.
New York	1,040,000	956	48
Philadelphia	775,000	458	31
Brooklyn	450,000		
Boston	350,000	214	32
Providence	100,700	42	22
Worcester	50,000	19	20
Lowell	50,000	17	18
Cambridge	50,000	21	22
Fall River	45,000	28	32
Lawrence	35,000	11	17
Springfield	33,000	7	11
Lynn	28,000	15	28
Salem	26,000	11	22

Resigned and Discharged. — Dr. Charles A. Holt, of Chelsea, Asst. Surgeon First Regt. Infantry, M. V. M., July, 1875.

Appointment. — Dr. Robert Amory, appointed Assistant Surgeon First Battalion of Light Artillery, M. V. M., to fill an original vacancy, passed a successful examination before the Board of Medical Officers, M. V. M., July 30, 1875. Edward J. Forster,
Surgeon Fifth Regiment of Infantry, M. V. M., Recorder of Board.

Appointment and Promotion. — First Brigade, Medical Director (rank Lieutenant-Colonel), Joseph W. Hayward, of Taunton, Surgeon Third Regt. Infantry, July 22, vice Stedman, discharged.

General Orders No. 12, just issued from the Adjutant-General's Office, dated July 21, is as follows: The examination of medical officers, as provided in General Orders No. 23, series of 1874, shall be dispensed with in cases of officers already in the service or who have been once examined by the Board, upon their receiving a new appointment.

Books and Pamphlets Received. — Étude chimique sur la Source sulfurée sodique forte et iodo-bromurée de Challes. Par le Dr. F. Garrigou, Médecin consultant à Luchon. Chambéry: Albane, Conio, and Blauchet. 1875.